

Research Report

2017-2023



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THE MALDIVES NATIONAL
UNIVERSITY



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Welcome Message

(Research & Enterprise)

It is with immense pride and pleasure that I welcome you to this latest research report from The Maldives National University. Over the years, we have made remarkable strides in fostering a robust research culture at our institution, and this report stands as a testament to the dedication and innovation of our academic community.

At MNU, we have witnessed significant improvements in the quality and impact of our research endeavors. The research grants provided by the university have grown not only in quantity but also in the scope and quality of applications. This upward trajectory reflects the commitment of our researchers to addressing critical issues and contributing to knowledge creation at both national and international levels.

Our faculty members and students have excelled in publishing their findings in reputable journals, underscoring the university's growing presence in the global academic arena. Additionally, external research funding has substantially increased, enabling us to undertake ambitious and transformative projects that tackle pressing challenges across various fields. These advancements in research directly contribute to improving the quality of teaching at MNU by integrating the latest knowledge and discoveries into our academic programs. Furthermore, as our research output and reputation grow, they play a crucial role in enhancing the university's ranking on both regional and global scales.

As we continue to enhance our research capacity and output, I extend my heartfelt gratitude to our researchers, staff, and partners for their unwavering support and collaboration. Together, we are paving the way for a brighter future, driven by innovation and excellence



Dr. Raheema Abdul Raheem

Deputy Vice Chancellor (Research and Enterprise)
The Maldives National University

The South Asian Nitrogen Hub (SANH)

The South Asian Nitrogen Hub (SANH) is a UK – South Asia research partnership that aims to enable South Asia to adopt and champion a strategic approach to Nitrogen management as a key step towards Sustainable Development Goals (SDGs). Collaborating Partners include various research and education institutions across India, Sri Lanka, Pakistan, Bangladesh, Afghanistan, Nepal, Bhutan and Maldives. The partnership brings together 32 leading research organizations with project engagement partners from the UK and South Asia. SANH is funded by the UK Research and Innovation (UKRI) and Global Challenges Research Fund (GCRF). The Maldives National University (MNU) acts as the Collaborating Partner for Maldives, working together with the Center for Ecology and Hydrology (CEH) of the Natural Environment Research Center. With funding from the UK Research and Innovation (UKRI) and through its Global Challenges Research Fund (GCRF), MNU assumes the role of implementing the Work Packages of the Project to ensure its completion.

GOAL AND OBJECTIVES

The overall goal of SANH is to develop an approach that links the many impacts of human alteration of the nitrogen cycle on environment,

health, food security and climate resilience. The partnership recognizes that historical specialization across the nitrogen cycle has led to fragmented policy responses, often associated with little progress. The hub therefore builds interdisciplinary integration as a foundation to overcoming the barriers, which is vital to meet the Sustainable Development Goals.

SANH has four key objectives:

- To establish an approach that integrates the scientific, social, cultural and economic evidence needed for an effective NITROGEN POLICY ARENA.
- To identify the solutions to producing more food and energy with less pollution, maximizing resilience and co-benefits, while minimizing trade-offs.
- To improve understanding and awareness of KEY NITROGEN THREATS in South Asia, including education through Massive Open Online Courses (MOOC)s.
- To integrate regional nitrogen flows and impacts in South AsiaSouth Asia



Project Title: The South Asian Nitrogen Hub (SANH)
Duration: May 2019 – Feb 2024
Amount spent from 2019 - 2023 = £ 191,331.92



SANH IMPLEMENTATION IN MALDIVES

In the Maldives, SANH activities are being implemented by The Maldives National University (MNU) in close coordination with the UK Center for Ecology and Hydrology (CEH)



OUTCOMES AND ACHIEVEMENTS OF SANH 2023

To achieve the 4 objectives, there are 4 Research Programs each of which are divided into 4 work packages. MNU is leading programs under all 4 of the research programs conducted by SANH and the achievements of 2023 are as follows;

Research Program 1: Building the Nitrogen Policy Arena for South Asia

Work Package 1.1 Evaluation of current policies, progress & barriers across different scales

WP1.3 Evaluation of nitrogen options for economic & social benefit in the context of environmental diplomacy

- Completed and published the National Nitrogen Policy Report for Maldives during the first Quarter of 2023.
- Completed socio-economic surveys of farmers to assess the use of farming techniques, common crops grown, use fertilizers and perceptions on the use of both organic and chemical fertilizers and pesticides and the effects on farming. The surveys were completed in AA. Thoddoo and L. Gan in 2023.

Research Package 2: Nitrogen solutions to maximize resilience, co-benefits & reduce trade-offs

Work Package 2.2 Village level engagement & testing of solutions across South Asia

- The project management team of MNU and UK-CEH engaged the Marketing team of MNU to produce village videography for 3 villages across South. Asia. Videos were completed for AA. Thoddoo in Maldives, Dharusha Village in Bangladesh and Lekhani in Nepal. The Marketing team of MNU received compliments for the quality and professional delivery of the products produced for this purpose.



Research Package 3: Improving understanding & awareness of key nitrogen threats

Work Package 3.2 Role of eutrophication in exacerbating coral bleaching & coastal impacts

Work Package 3.3 Nitrogen education: Integrating perspectives across the nitrogen cycle

- With the support of University of Edinburgh and Maldives Resilient Reefs water sampling sites were determined as K. Villimale' and AA. Thoddoo. The sampling locations comprise of marine areas surrounding the islands, and groundwater sampling points strategically identified in both islands. Water sample collections/testing are on-going with the assistance of an external field research expert. This work was initially carried out by a lecturer from Faculty of Engineering Science and Technology (FEST) at MNU. However, due to the lecturer assuming studies abroad during the 3rd

Quarter of 2023, a field research expert was hired for this purpose. Samples collected during the first 2 Quarters have been assessed and the results were shared with the technical teams of SANH. The methodology and tools used for this study will be packaged into a training module to be handed over to MNU during the first Quarter of 2024, so that it can be integrated into the relevant courses offered at the university.

A hand-held probe was purchased and handed over to FEST for use in the study. Additional equipment/ materials sourced for the study includes a chest freezer, cooler boxes and sample collection bottles.

An MOU has been signed with MWSC in order to institutionalize assessments required for the study.

- Two Massive Open Online Courses (MOOC) developed by SANH is available as a free source for study on the Ed Ex online courses platform. The Introductory MOOC is also available in Dhivehi language.



Research Program 4: Integrating regional nitrogen flows & impacts in South Asia

Work Package 4.2 Role of urban and rural nitrogen sources for air quality & health

Work Package 4.3 Role of urban and rural nitrogen sources for soil, water quality & health

- DELTA system and Wet deposition sampler set-up has been completed with assistance from Maldives Meteorological Services (MMS) at K. Hulhule' and H. Dh. Hanimaadhoo Met stations. To formalize this partnership an MOU has been signed by MMS
- Air and water samples are collected daily and for each rain event respectively.

GENERAL



- The SANH project management team participated in the Annual meeting held in Kandy, SriLanka in October 2023.
- A Stakeholder engagement workshop was held during Theveli 2023, led by Professor Mark Sutton and the project management team at MNU.
- With the assistance of Professor Mark Sutton and senior research staff from RDO, SANH team has submitted a proposal and won the call for proposals from the “Clean and Healthy Oceans” project. The Proposal was submitted by the Ministry of Environment and the title of the proposed project is “Sustainable Nitrogen Management for a Clean & Healthy Ocean: Maldives as a SIDS regional catalyst”. The executing agency for the project would be MNU. The GEF agency for the project would be UNEP and it would be implemented in partnership with UK-CEH.

PROMISE PROJECT

Prevention of Marine Litter in the Lakshadweep Sea (PROMISE) is a 4-year project (2020-2024) supported by the European Union (EU) under the SWITCH Asia Programme. Tourism industries have been identified as major contributors to marine litter due to high consumption rates of fast-moving consumer goods (FMCG) and convenience products wrapped in single-use plastic packaging. In many touristic regions of the global south, this is aggravated by the absence of effective policy frameworks, a lack of consumer awareness and insufficient capacities of local authorities to handle the increasing solid waste. The Maldives, Sri Lanka and India have undergone substantial growth in tourism clusters located along their shorelines of the Lakshadweep Sea. While this has increased the economic well-being of the local population, these developments have also come at a high price. The PROMISE project responds to this by preventing leakage of wastes from land-based sources into the Lakshadweep Sea in line with a Sustainable Consumption and Production (SCP) approach. To achieve the desired impact, the activities target tourism clusters located along the Lakshadweep shorelines in the Maldives, Sri Lanka and India. The Maldives National University in the lead implementing partner of the project.



Duration: July 2020-June 2024
Total Budget: EUR 3,709,882.60 (EU contribution 80%)



OUTCOMES AND ACHIEVEMENTS OF PROMISE 2023

WP1 – Material Flow Analysis (MFA) and Cost Accounting

In 2023, a new methodology for collecting MFA was created to identify the waste along the beaches in all three countries. Using this new methodology, three studies were done, and 29 manual samples.

WP2 – Waste Minimization Actions Based on RECP and AIR

311 assessments were conducted to achieve waste minimization and resource use reduction in participating MSMEs. Research reports were presented to these MSMEs identifying waste minimization methods, energy saving devices, and also additional implementations to maintain the sustainability of the enterprises. Total of 551 individuals from MSMEs have greater awareness through direct consultancy and other project activities.

WP3 – Conceptualization and Initiation of Zero Waste Alliance

Project PROMISE has established Lakshadweep Zero Waste Alliance (LOWA) – which is a non-governmental organization (NGO) registered in the Maldives along with the consortium partners. This alliance will enable the continuation of the project after it is completed in 2024.

Apart from that, as part of the project, 2 PROMISE Sustainability Awards has been held (1st award in the Maldives and 2nd award in India). In 2024 there will be the 3rd award will be held in June in the Maldives.

WP4 – Access to Finance for Waste Prevention

Under the Access to Finance (A2F) component of the project, the project partners have conducted capacity building workshops for financial institutes in all 3 countries. These events were held to increase the understanding of the available Green Finance schemes in the countries

which is passed onto the MSMEs in the project. Along with this, MSMEs are also being sensitized on the available green finance schemes which will be assisted by the project partners to move forward towards accessing loans or schemes.

WP5 – Policy Advocacy for Source-to-Sea Approaches

Series of policy roundtable meetings have been held in the Maldives, Sri Lanka, and India with policy makers, ministries, NGOs, and other stakeholders to discuss the underlying issues of waste management and other related issues in the respective countries. A regional policy dialogue will be held to showcase the results attained through the policy roundtables.

WP6 – Knowledge Dissemination and Consumer Outreach

Over 765 tonnes of waste have been

collected under the project out of which 576 tonnes are plastic waste. The project aims to collect 1000 tonnes of waste and send for closed-loop recycling. Apart from that, 104,000 people have been made aware of the marine litter prevention and issues through the project.





Our World Our Futures

Our World, Our Futures aimed to connect researchers, primary school teachers and primary-school-age children in two contrasting geographical, economic and social settings - the UK and the Maldives – to develop and evaluate an innovative cross-curricular Education for Sustainable Development (ESD) project premised in the values of stewardship, inclusivity, empathy, global citizenship, collegiality, transparency and commitment and professional integrity. This project also supported UN's Sustainable Development Goals, UK's draft Sustainability & Climate Change Education strategy and the Maldives Strategic Action Plan and the implementation of the National Curriculum, especially the science component of it. Drawing on the varied perspectives and expertise of an international, interdisciplinary research team, the project aligned with Oxford Brookes' Guiding Principles and 2035 Strategy and the values of the project partner institution, The Maldives National University (MNU)

- to develop a model of education for sustainable development and global citizenship that builds on children's, teachers' and researchers' knowledge and expertise.
- to understand how this model of environmental education supports children's cross-curricular learning and their global citizenship as well as teachers' professional development as innovators within their schools.

To achieve this purpose, this project brought together teachers and researchers, across national and institutional boundaries, to develop and evaluate innovative, cross-curricular ways of teaching for sustainability and global citizenship. Through intercultural dialogue, including the use of art and digital media, children shared their local environmental knowledge, learn to understand each other's perspectives, and take action as global citizens.



The project was funded by an Oxford Brookes Research Excellence Award, and involved an international and interdisciplinary team of researchers with expertise in science, arts, literacy and environmental education and children's futures thinking from the UK and the Maldives. The purposes of this study were:



Project Title: *Our World Our Futures*
Grant Amount: 17283
Principle Applicant: *Aminath Shiyama, Claire Lee, Fathimath Nasiha, Abdul Muhaimin, Fathimath Shafeeqa & Tim Jones*

University Network for Disaster Risk Reduction and Management in Indian Ocean Rim (UN4DRR)

The overall aim of the UN4DRR project is to modernize the courses related to Disaster Risk Reduction and Management integrating GIS/RS applications as the significant part of the course content. The long-term effect will be to educate future experts for prevention and management of natural and human-induced disasters (e.g. fires) in the Indian Ocean Rim supporting national and EU policies. The project encourages the cooperation with national authorities, public and private sector offering joint DRRM initiatives and access to short courses for use of GIS/RS via online/offline mode. The project also motivates a more proactive cross-region dialogue in DRRM related educational program in the realization of capacity building and internationalization.

The specific objectives of the project are related to the preparation and design

of appropriate train-the trainer programs for curriculum development on use of GIS/RS for DRRM following Bologna standards and comparability with ECTS. Partner HEIs will be equipped with improved/modernized GIS/RS laboratories with the latest hardware and software equipment for risk mapping, simulations and assessments of disasters, where the students will gain practical knowledge that can be immediately applied. The course content will serve to improve the research and practical skills of graduate and postgraduate students making use of state-of-the-art GIS/RS methods for DRRM. Likewise, short modules will be accessible for both public and private sectors. To embed a culture of quality to its outputs and outcomes, adequate management tools (quality plan, dissemination plan, risk assessment, management plan) will be installed for correct implementation of the project right from the beginning.



Project Title: *University Network for Disaster Risk Reduction and Management in Indian Ocean Rim (UN4DRR)*

Grant Amount:

Principle Applicant: *Shazla Mohamed, Abdulla Afeef, Ahmed Aslam Waheed, Hassan Shiraz, Ibrahim Nadheem & Asma Rushdy*



Strategic Support for Accreditation of Programs and Internationalization at South Asian Higher Education Institutes (SSAPI)



This project aims to create learning and practicing opportunities for partner country HEIs staff including administrative staff, faculty, students and researchers. Trainings will focus on learning from EU partners, and developing procedures to modernize the education system. This project will contribute effectively in creating reforms in the overall higher education system of the partner HEIs. The role of MNU in this project is share information, resources , organise staff exchange, liaise with other partners and conduct meetings and visit partner institutions. MNU will also facilitate to play a role to assist the delegates who visit MNU under this project. MNU will collaborate and work with other partners in order to achieve the goals of this Erasmus project.

For a small country that has only opened its first university in 2011, the Maldives has seen a massive increase in higher education enrolment in recent years. At the end of 2018, more than 85 HEIs are registered with the Maldives Qualifications Authority (MQA). Jointly, these institutions offer more than 1,500 programmes at varying levels. Cross boarder provision and virtual learning has become a common place. In this shifting landscape, managing standard and quality of higher education has become a serious challenge both for the higher education providers and for the governmental agencies. Institutional reviews and programme reviews started by the Maldives Qualifications Authority in 2017 are hindered by the lack of trained personnel. Only a handful of trained reviewers are available to participate in these tasks thereby limiting the coverage and effectiveness. Quality monitoring, assessment and enhancement cells within most of the HEIs



are weak and are in serious need of trained personnel. These issues need to be tackled as the country embarks on its ambitious programme of providing free undergraduate education. The SSAPI project will stand as an important contributor to bridge these gaps and help the human capital building in standardization and internationalization of HEIs at this crucial junction of HE provision in the Maldives. Exchange of staff and cross-border collaboration among the participating institutions will provide training opportunities for a number of professionals in this area, who could then provide the necessary trainings at the national level and disseminate best practices. Individual HEIs will directly benefit from the programme through improvements in the structures and procedures while cooperation amongst the participating institutions are likely to lead to large-scale structural projects. Through local competency building, the university management would be better able to manoeuvre the direction of these institutions and face the contemporary challenges in the area of international accreditation.



T3.1 Development of Learning Material and Training Methodology This task will deal with identifying and then developing the required learning material, as per the need of the training participants in each partner country HEI. Then the appropriate training methodology will also be devised, keeping into account its effectiveness in the local context.

T3.2 Monitoring and Evaluation of Trainings This task deals with assuring that trainings are conducted in the best appropriate manner, in order to maximize their

effectiveness, and that the participants have gone through a good learning experience. This task also deals with conducting survey and obtaining feedback from the training participants to assess whether the desired outcomes were achieved. Consequently, the team will also suggest remedial measures and corrective actions, along with suggesting any improvement in learning material or training methodology.



Project Title: *Strategic Support for Accreditation of Programs and Internationalization at South Asian Higher Education Institutes (SSAPI)*

Grant Amount:

Principle Applicant:

Climate Change Diplomacy, Leadership and Resilience (CHILDRN)

The Climate Change Diplomacy, Leadership and Resilience (CHILDRN) project, funded by the European Union, with the Maldives National University as a partner institute, has been completed and validated by the European Union. Through close cooperation with the Maldives National University (MNU), the University of Economics of Bratislava and the University of Paris, CHILDRN will strive to empower the Maldivian society to tackle the pressing issue of climate change in the fields of climate diplomacy, leadership and resilience.

OBJECTIVES

The overall goal of CHILDRN is to build the capacity of the MNU and the Maldivian society at-large to tackle the pressing issue of climate change in the fields of climate diplomacy, leadership and resilience.

This will be achieved through three main objectives, each of which has been developed jointly with the MNU in order to respond effectively to local realities.

1. Improve and strengthen the teaching capacities of partner institutions in the field of climate studies
2. Encourage interdisciplinary academic cooperation and exchanges to strengthen the research capacities of partner institutions
3. Implement and develop joint activities, events, publications and projects related to diplomacy, leadership and resilience in the face of climate change.



HIGHLIGHTS OF THE PROJECT

- A kickoff meeting and a 'Need Assessment and Curriculum Development' workshop were held at the Hithadu Campus, Addu City on 24-25 October.
- An internal training was conducted on 20 November 2021 in Male' City.
- Some lecturers from FEST and FA participated in the Staff Mobility Program conducted at the University of Liège, University of Paris Cité, and University of Economics in Bratislava from November to December 2022, gaining practical experience in their respective fields.
- A 'Research Workshop' was conducted in Male' City from February 26-28, 2023, with the objective of writing and publishing research papers in international journals in the fields of Democracy, Environment, Law, and Health in relation to Climate Change.

HIGHLIGHTS OF THE PROJECT

- In October 2023, 14 students from the University, including FEST, FA, and FHS, completed a one-month ‘Student Mobility Program’ at the University of Liège.
- Assistant Professor Dr. Zeeniya Hassan Kamil and EU partner professors presented the poster “Advanced Climate Change and Health Learning in Maldives” at the IEEE LWMOOCs conference at MIT. It was prepared about the MOOC course designed under the project and won “The Prestigious Best Poster” award.
- In 2023, one student from the University of Liège and two from the University of Economics in Bratislava completed a Student Mobility program at the Maldives National University. The Bratislava students took courses at the Faculty of Arts and sat for exams, while the Liège student conducted research and completed a thesis on climate change in the Maldives.



- Nine staff members from FEST, the University’s Deputy Vice-Chancellor Academic, and two lecturers from FHS participated in an ‘Exposure Trip’ conducted at the University of Liège and the University of Paris Cité from November 29 to December 9, 2023.
- To raise awareness about climate change and environmental issues in the Maldives and facilitate research in this field, The Maldives Summer School was held for the first time from December 15-20, 2023, targeting both local and international students. Ten international students participated in the program.
- The Bachelor of Science in Climate Change program, developed under this project, was approved by the Maldives Qualification Authority (MQA) in 2023. It is structured to offer exit options at the Diploma and Advanced Diploma levels. The program will commence in the first term of 2025 at both the Malé and L. Gan campuses.

University Research Grants 2023

Assessing the Adaptation Potential of Atoll Islands in the Maldives and Developing Customized Adaptation Plans for Islands

The future of low-lying reef islands has been the subject of international concern, scientific debate, and media interest in the last decade. As a result of sea-level rise, atoll islands are expected to become increasingly unstable and islanders are to be susceptible to potential migration by the end of the 21st century. In all Maldivian islands the only habitable land for settlement, agriculture and infrastructure are small, reef islands that only surface up just a few meters above mean sea level. Biogenic sand and coral rubble make up the main composition of the sediments that make up the islands, that mainly get washed ashore by waves and currents that rampage on the rims of atolls or on the interior reefs and the lagoons, with many islands still developing physically both naturally and anthropogenically. There is empirical evidence on shoreline changes in Maldivian atolls (Aslam & Kench, 2017) however, there is less evidence on the discourse of the crisis dominated by the spectre of sea-level rise, sinking islands and disappearing rather more, evidence on

the dynamism of island shorelines have been scientifically proven within laboratory set ups Gerd (2020) and that islands have been growing vertically and horizontally along the platforms (Aslam & Kench, 2017). The Maldives has not yet studied its adaptation potentials, especially at island levels. Several island vulnerability capacity assessments were done after the Tsunami of 2014 funded by various Red Cross and Red Crescent societies around the world, which are to date not updated and the methods behind these assessments require additional science base to conjure for climate change challenges. This research intends to provide insights into alternative adaptation pathways which support the ongoing mitigation actions to curtail future sea level impacts and climatic changes on small island nations and help formulate policy to embrace new adaptation pathways through efforts to sensitise public on the adaptation potentials of island nations including engagement of local authorities on what adaptation pathways might look like.



Project Title: *Assessing the Adaptation Potential of Atoll Islands in the Maldives and Developing customized adaptation plans for islands.*

Grant Amount: MVR 731,378.00

Principle Applicant: Ahmed Aslam Waheed

Study on Senior Citizens and Ageing Well in the Maldives

The research aims to assess the perceptions of well-being among senior citizens in the Maldives, with a focus on factors associated with elderly well-being, challenges faced by seniors, and the promotion of positive aging. The interdisciplinary approach involves desk reviews, stakeholder consultations, public perception surveys, and focus group discussions.

The research methodology includes a multistage cluster sampling strategy, questionnaire design covering identifiers, background characteristics, and indicators for data disaggregation, as well as enumerator selection and training. Enumerators will use tablets for data collection, and a pilot test will be conducted in Male' and another selected island.

The study involves a sample size of 1155 respondents from three main regions, and data collection will be both quantitative and qualitative. The research team plans to employ advanced statistical methods for analysis, aiming to map out perceptions, issues, and challenges faced by senior citizens. The final report

will be shared with stakeholders, incorporating feedback, and a validation workshop will be conducted.

The project team comprises the Principal Investigator, Dr. Aishath Shehenaz Adam, and Co-investigator, Dr. Mariyam Mariya, both bringing significant expertise to the research. The timeline includes various stages such as team composition, project initiation, desk review, stakeholder consultation, pilot testing, data collection, analysis, and the finalization/validation workshop.

The study seeks to contribute valuable insights into the well-being of senior citizens in the Maldives, aiming to inform policies and initiatives for better senior health and positive aging.



Project Title: *Study on senior citizens and ageing well in the Maldives.*

Grant Amount: *MVR 368,858.00*

Principle Applicant: *Aishath Shehenaz Adam*

Co Applicant: *Mariyam Mariya*

Factors Affecting Dementia: A study conducted at IGMH, Maldives.

The prevalence of Dementia has grown worldwide due to the ageing phenomenon (Fratiglioni, L. et al., 1999). In a meta-analysis that included forty-seven studies, the pooled prevalence among individuals 50 years and above was 697 per 10,000 persons for all-cause dementia. which doubles every five years (Cao, Q. et al., 2020). Among countries, the highest prevalence was in Europe and North America followed by Asia, Africa, and South America (Cao, Q. et al., 2020). The incidence of dementia was estimated to be 34.1 per 1000 among individuals above 60 years. (Fiest, K. M. et al., 2016). For estimates in this region; an analysis of 7 databases, estimated a dementia prevalence of 3.1% for individuals above age 60 years in the South-East Asia Region, which varied; increasing from 1.6% to 12.4% for people aged 60-69 and 80 years. The total number of people living with dementia was estimated at 5.51 million in 2015, that would reach 9.6 million by 2030 (Poon, A. N., 2020). The most common type of dementia in

this region was Alzheimer's Disease (59.8%), followed by vascular dementia (14.9%) and frontotemporal dementia (11.1%) (Vipin, A. et al., 2021).

Dementia is characterized by a progressive decline in cognitive functions which occur due to a variety of underlying pathophysiological changes. The most common type of dementia is Alzheimer's disease (AD) (50-75%) followed by vascular dementia (20%), dementia with Lewy bodies (5%) and frontotemporal lobar dementia (5%) (Cunningham, E. L. et al., 2015). Two of the strongest predictors of dementia are age and sex (Kim, S. et al., 2015). The Framingham Study showed a lifetime risk of AD for men and women above 65 years of age at 6.3% and 12% respectively (Seshadri, S., et al., 1997). Interestingly, a recent study showed lower incidence rates of dementia for women than men (Gong, J., et al., 2021).

We agree with Hossain, M. et al., (2020) and Wijesinghe, P. et al., (2017) about the limited published studies of

dementia in the Maldives. To the best of our knowledge, we did not find further publications of national data that could describe dementia or its characteristics in the Maldives. Available publications differed; even though the Institute for Health Metrics, Alzheimer's Disease jumped from 8th place to 7th place of from 2009 to 2019, as the top leading causes of death in the Maldives (Institute of Health Metrics, 2022), the Maldives Health Statistics (Ministry of Health, Maldives: 2020), states "other neuro-psychiatric diseases", as occupying 19th place in the causes of death.

The purpose of this study is to assess cognitive decline and dementia among persons older than 55 years, patients presenting to IGMH OPDs of Memory Clinic. In addition to this, we aim to identify factors; socio-economic, hereditary, genetic, behavioral, diagnostic factors that may contribute to the onset of dementia as well as identify protective factors within the study population, that would favor maintaining cognition in the elderly and thus prevent dementia.



Project Title: *Factors affecting Dementia: A study conducted at IGMH, Maldives.*

Grant Amount: *MVR 1,000,000.00*

Principle Applicant: *Dr. Razana Faiz*

Co Applicant: *Dr. Ahmed Rash-eed*

Epidemiology of Badminton Injuries in Republic of The Maldives

This research proposal aims to study badminton injuries among amateur middle-aged players in Maldives, focusing on their frequency, location, severity, and associated factors. The study design is cross-sectional, targeting players in Malé, Maldives, and aims to gather data through a questionnaire distributed via convenience sampling.

The objectives include determining injury incidence, locations, severity, and structures prone to injuries among amateur badminton players. The study also aims to investigate the association between injuries and player performance.

The proposed methodology involves survey administration, data collection from local clubs and recreational centers, and statistical analysis using SPSS. The project timeline spans from questionnaire design to result analysis, discussion, conclusion, and publication over several months.

The expected outcomes anticipate a higher prevalence of lower extremity injuries due to the demanding movements in badminton, potential overuse injuries linked to playing hours, and increased susceptibility of shoulder injuries due to specific arm movements.

Additionally, the research emphasizes the importance of preventive strategies, such as education, awareness, and injury screening, and plans to align with Maldives' strategic action plan for 2019-2023.

The budget outlines various expenses for consultations, MRIs, X-rays, transportation, research assistant salary, and stationary needs, totaling to a projected cost of 456,750 units.

The literature review highlights studies on shoulder injuries, joint movements during badminton strokes, and assessments of shoulder mobility and tightness among racket sport players.

In summary, the study focuses on an underexplored area of badminton injuries in Maldives, aiming to fill the data gap, understand injury patterns, and suggest preventive measures for players' well-being.

Project Title: *Epidemiology of badminton injuries in Republic of The Maldives.*

Grant Amount: *MVR 456,750.00*

Principle Applicant: *: Dr. Shaistha Zubair*

Co Applicant: *: Dr. Shekhair Kumar Yadav*

Understanding the Health Impact of Imported Chicken, A Pilot Project.

There is a significant burden on the Maldives healthcare system and economy from zoonotic infections. The country has a high burden of infectious diseases, and antibiotics are widely used in the treatment of these diseases. However, there is very limited data on the prevalence of zoonotic bacteria and patterns of antimicrobial resistance (AMR) in the Maldives, and this is a growing concern for public health officials.

This proposed project combines microbiology with cutting edge genome sequence analysis to understand the risk imported poultry present to the nation's health. Zoonotic pathogens *E. coli* and non-typhoidal *Salmonella* will be isolated from poultry products and the levels of AMR, with implications to first line therapy, determined. Whole genome sequencing (WGS) will be used to provide insight into the genes and mechanisms responsible for AMR in the isolates as well as providing epidemiology data and transmission of these organisms. The project will generate the first bacterial genomes for the nation and to ensure sustainability a bioinformatics workshop will be organised training MNU staff and

students. Very few studies on bacterial pathogens and the presence of antimicrobial resistance (AMR) had been published in the Maldives. This project aligns with the government aim to develop and strengthen AMR surveillance system in all regions of the country. The project will also improve research output, significantly it will allow for staff and students to gain experience of WGS bioinformatics.



Project Title: *Understanding the health impact of imported chicken, a pilot project.*

Grant Amount: *MVR 772,360.00*

Principle Applicant: *Zeeniya Hassan Kamil*

Co Applicant: *Richard Stabler*

Investigating the Factors Contributing to the Decline in Seaman Numbers in the Maldives: A Quantitative Study.

Investigating the factors contributing to the decline in seaman numbers in the Maldives. The study will use survey questionnaire to collect data from seamen working in the Maldives. A random sample of seamen will be selected from different regions in the Maldives. (1-Kulhudhuffushi City. 2- Greater Male' region. 3-Th. Atoll. 4-Fuvahmulah City and 5-Addu City). The Survey will include questions about the seamen's socio-demographic characteristics, work experience, job satisfaction and reasons for leaving the industry. the data will be analyzed using descriptive and inferential statistics. The Maldives is an island nation with a rich history of seafaring. However, the industry is facing challenges due to a decline in the number of seamen. This study aims to explore the reasons for the decline in seamen numbers in the Maldives. A purposive sampling technique will be used to select seamen who have left the industry or are still working in the industry. The interviews will be conducted in the local language and will be audio-recorded with the permission of the participants.

the data will be analyzed using content analysis..

Project Title: *Investigating the Factors Contributing to the Decline in Seaman Numbers in the Maldives: A Quantitative Study.*

Grant Amount: *MVR 172,948 .00*

Principle Applicant: *Hussain Hameed Moosa*

Co Applicant: *Mohamed Zaid*



Behind the Prison Walls: *Stress, Burnout and Overall Health and Wellbeing Of Corrections Officers in the Maldives*

This project aims to study a very vulnerable yet neglected group of our population, i.e Correctional Officers. Research in this area is limited and a study is required to understand the unique difficulties of this very important frontline worker group in order to improve their work conditions and create a healthier work environment for them. This will help to improve the prison environment and create a space where they can focus on the work demands of monitoring and rehabilitating inmates. Methodology: This study is a quantitative study which will use a general demographic questionnaire to understand some key information of participants. It will then use several standardized tools to test for stress, general health and mental health, coping techniques, burnout and work-life balance of corrections officers. The data will be analyzed using SPSS. Descriptive and statistical testing will be done to draw conclusions for the objectives of this research. Outcomes of research: This research aims to understand the situation of correctional officers in Maldives. As this is not an area which has been researched in Maldives in this fashion, it will provide new knowledge and under-

standing to the area of front-line work in prisons and related challenges for the officers. It will also create an opportunity for dialogue in the policy making level and will aid in better policy making to create a more harmonized and healthy work environment for correctional officers. One key outcome we are aiming for is to facilitate the department of corrections to identify areas that officers require support for and recommend ways to incorporate support within the organization so that corrections officers can perform their roles effectively and can have a prolonged and successful career.



Project Title: *Behind the prison walls: stress, burn-out and overall health and wellbeing of corrections officers in the Maldives*

Grant Amount: *MVR 81,890.00*

Principle Applicant: *Mariyam Neerish*

Co Applicant: *Zeenath Shakir*

Exploring the Sustainability of the Accommodation Sector in the Local Islands of the Maldives: A Case of Kaafu Atoll

The study aims to explore stakeholder perceptions of sustainable growth in the accommodation sector on the local islands of the Maldives. It delves into existing and future sustainable practices in place, evaluates socio-economic consequences of unplanned development, and investigates the role of the local community in this sector's development. The study examines the rapid growth of accommodation facilities, their impact on local economies, and gaps in understanding sustainable development.

It utilizes a multi-method approach, including focus group interviews with council members and locals, individual interviews with accommodation service providers, and a review of existing regulations and policies. The hypothesis suggests that current growth patterns might not be sustainable and could lead to adverse consequences for the destination and stakeholders.

The significance lies in contributing to knowl-

edge on sustainability in Small Island Destination States (SIDS), fostering better policies for sustainable growth, empowering local communities, and promoting socially responsible businesses. The methodology outlines a detailed plan for data collection, participant selection, interview structure, and ethical considerations.

In essence, the study strives to offer insights into the sustainable development of the accommodation sector in the Maldives, addressing gaps in understanding, and providing valuable information for policymakers and industry players.

Project Title: *Exploring the sustainability of the accommodation sector in the local islands of the Maldives: A case of Kaafu Atoll*
Grant Amount: *MVR 82,100.00*
Principle Applicant: *Sadha Ahmed*



Research Contributions by MINU Staff

Survey of Popular Livebait Fisheries Fishing Grounds in the Maldives

It is fair to assume livebait fishing takes place throughout the Maldives — on shallow reefs and slopes and in atoll lagoons. But it is different to ask fishers to mark them on a map of 0.025° x 0.025°- degree spatial resolution across the atolls of the Maldives. That was the main objective of this project – to identify livebait fishing grounds in the Maldives by fishers themselves, including what species they caught, how frequently they fish and in what seasons. Why? The answer is simple. Tourism development has been rapid and still ongoing. In the process, the authorities have been allocating uninhabited islands and, recently submerged reefs/shallow lagoons to reclaim islands. Depending on the geographic nature of the island, resorts have exclusive rights up to 500 – 1000 meters from the shoreline. This puts fishers at a disadvantaged position as more and more potential livebait fishing grounds are becoming out of bounds to them. It is hoped the identification of livebait fishing grounds on maps indicating their preference and use of those sites in the Maldives will be useful for spatial planning purposes and help improve environmental impact assessments of development projects, such as resorts, reclamations, and dredging. More importantly it is also believed that the work would contribute to conservation and management of livebait fishery, critical for pole-and-line and handling tuna fisheries of the Maldives. The report also provides an analysis of fisher perceptions on topical issues of livebait fishery; their practice and views on how best to conserve and manage the resources including their willingness to pay for both wild caught and cultured livebait if they are readily available. The report also provides some interesting confirmation of results of the perception survey through an exploratory analysis of the fishery observer data on livebait (for years 2014-2021) reported here for the first time. Data preparation and mapping of bait fishing grounds were done by Mohamed Shimal. Dr. Ahmed Riyaz Jauharee helped in developing and trialing the survey for gathering information from fishers and compiled the first chapter on review

of livebait fishery. The survey tool was developed in collaboration with the Maldives Marine Research Institute. Dr. Shiham Adam conducted observer data analysis, compiled and edited the report. Ibrahim Nadheeh and Ibrahim Saneeh spent numerous hours with fishers meticulously recording responses from fishers and marking fishing locations on maps.

Project Title: *Survey of Popular livebait fisheries fishing grounds in the Maldives*

Grant Amount: *MVR 586750*

Principle Applicant: *Mariyam Nashath & Dr Mohamed Shiham Adam*



Methylenetetrahydrofolate Reductase (MTHFR) gene C677T Polymorphism and its Association with Folate, Homocysteine, Anaemia, Menstrual Cycle Patterns, Outcomes of Pregnancy and Risk for Cardiovascular Diseases in Females

A research project investigating the relationship between the MTHFR C677T polymorphism and various biochemical variables in the Maldivian population is underway. The project aims to understand how this genetic variant impacts factors like folate levels, homocysteine levels, anaemia, menstrual cycle patterns, pregnancy outcomes, and cardiovascular disease risk in females. With a grant of MVR 896,756.00, the study is crucial for addressing public health concerns related to these conditions.

Previous research has linked the MTHFR C677T polymorphism to reduced enzyme activity, lower folate levels, and higher homocysteine levels, which are associated with cardiovascular diseases and adverse pregnancy outcomes. Inadequate folate levels in women of reproductive age can increase the risk of neural tube defects in babies.

The project has faced challenges, including delays in sample collection, laboratory analyses, and obtaining NHRC approval. However, despite these obstacles, significant progress has been made, with data collection completed and genetic analysis underway. Once samples from the Kulhudhuffushi region are analyzed, further investigations will be conducted.

The research team requires assistance from the RDO to obtain enumerator certificates and reference letters, as well as a final report template and budget disbursement. Despite difficulties, the study promises to fill crucial knowledge gaps regarding the prevalence of the MTHFR C677T polymorphism and its implications for health outcomes in the Maldivian population, particularly among females.

Project Title: *Methylenetetrahydrofolate Reductase (MTHFR) gene C677T Polymorphism and its Association with Folate, Homocysteine, Anaemia, Menstrual Cycle Patterns, Outcomes of Pregnancy and Risk for Cardiovascular Diseases in Females*

Grant Amount: *MVR 896756*

Principle Applicant: *Zeba un Naher, Fatema Alzahraa Samy Mohamad Almoatasembellah Amin*

Co- Applicant: *Razana Faiz, Sheena Moosa, Sheeza Ali, Aminath Huda & Ali Umar*



An Exploration of Indigenous Community's Local Knowledge Practices Related to STEM Education: A Comparison Study Between Malaysia And Maldives

The demand for professional technicians, skilled and semi-skilled workers trained in Science, Technology, Engineering, and Mathematics (STEM) related fields are increasing. However, student interest in STEM-related subjects declining both at the school and post-school levels. Integrating STEM education strategies into a cohesive learning paradigm based on real word applications has been found to Increase students learning and employability. Engaging with the local indigenous knowledge win pedagogical approaches integrates the reel context experience and connects between the community local experience end STEM.

This study will establish a framework on how the indigenous, communities' local knowledge can be infused in STEM education. This study (1) Explores the indigenous community local knowledge practices related to STEM: (2) Profiles the local knowledge practices related to STEM education and (3) Formulates a STEM Education framework with the infusion

of indigenous community local knowledge practices related to STEM education in Malaysia and Maldives. A qualitative research methodology, using case studies of indigenous communities in Malaysia and Maldives will be employed. Data will be gathered through interviews and observations. Thematic analysis will be used. The indigenous community's local knowledge and practices related to STEM will be used to develop a STEM framework. This framework can be used by teachers, trainers, and lecturer to bridge between indigenous sciences and the western sciences and hence to increase students' interest in STEM subjects and further improve the environment and the achievement of students in indigenous communities in STEM Subjects

Project Title: *An Exploration of Indigenous Community's Local Knowledge Practices Related to STEM Education: A Comparison Study Between Malaysia And Maldives*

Grant Amount: *MVR 25000*

Principle Applicant: Dr Abdul Muhsin; Dr. Faruhana Abdullah; Ms Muhsina Mohamed; Ms Wadheea Thoufeeq, Ms Mariyam Nashath, Dr. Asniza Ishaq, Dr Sit ZUraidha' Dr Ahmed Zamri & Dr. Muaz Zaini



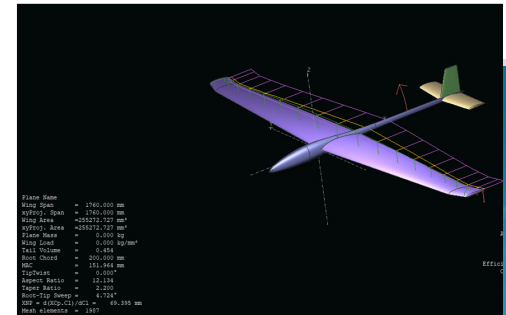
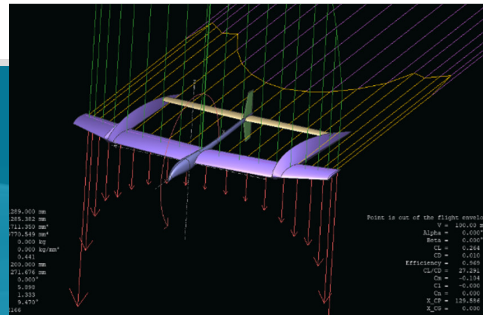
Development of a coastal surveillance airship to monitor and control the EEZ

This research project is about developing a high altitude and long endurance airship to monitor and control the EEZ of the Republic of Maldives. The proposed airship will be an Unmanned Air Vehicle (UAV) capable of flying at medium to high altitudes for a longer period of time with very high endurance. The airship will include monitoring systems to identify ships and other fishing vessels moving within the EEZ. The research project involves studying requirements of a UAV for the application and identifying the necessary intelligence which will be accomplished in four phases. In the first phase, a feasibility study will be conducted to identify the suitable type of airship for the proposed system. The second phase is dedicated for the design and development of the airship. The major works in this phase includes designing and prototyping of the airship. Testing of the airship for balancing capability and harsh weather (wind, rain, temperature) tolerance. The development of the monitoring systems to detect and track the moving targets and communication system between the airship and the ground station (control station) will be conducted in the third phase. Finally, the developed monitoring and communication systems will be integrated into the airship in the fourth phase.

Project Title: *Development of a coastal surveillance airship to monitor and control the EEZ*

Grant Amount: MVR 100,000

Principle Applicant: Yoosuf Nizam



National Roadmap and Guidelines for Water, Sanitation and Hygiene (WASH) in Healthcare Facilities

Water, Sanitation, and Hygiene (WASH) in healthcare facilities is a critical aspect of healthcare infrastructure and service delivery. It ensures the availability of clean water supply, adequate sanitation facilities, and proper hygiene practices to safeguard the health and well-being of patients, healthcare workers, and communities.

Project Title: *National Roadmap and Guidelines for Water, Sanitation and Hygiene (WASH) in Healthcare Facilities*

Grant Amount: *MVR 216000*

Principle Applicant: *Mariyam Rasheeda, Ashiyath Rasheed, Fathimath Haleem, Zeena A. Qayyoom, Aminath ShafiaShiuna*

Exploring the Sustainability of the Accommodation Sector in the Local Islands of the Maldives: A case of Kaafu Atoll

The economic contribution of tourism in host destinations, especially in Small Island Destinations States (SIDS) has been widely acknowledged by the tourism academia. Multiple studies have explored and examined the practices and operations of tourism and hospitality businesses. The vulnerability of SIDS and the volatility of the tourism industry calls for a proper narrative of unplanned or unsustainable development of specific sectors/ businesses within the context of a host destination. This study explores the extent to which the development of the accommodation sector is sustainable in the local islands of the Maldives. The study primarily focuses on the local islands of Kaafu atoll, where most of the lodging establishments are located. Using semi-structured interviews, the study provides an in-depth insight into the stakeholder's roles and understanding of sustainable development of the accommodation sector in their host destination.

Research aims and objectives.

1. To explore the stakeholder's perception on sustainable growth of the accommodation sector in the local islands of the Maldives.
2. Discover existing and future sustainable measures or practices in place for the sustainable growth of the accommodation sector.
3. Assess the current and future socio-economic

consequences of unplanned development of accommodation sectors in the local islands.

4. Explore the role of local community in the development of accommodation sector in the local islands.

Significance of study

The vast economic contribution tourism provides to the local inhabited islands where local tourism is established and their increasing dependency on the tourism industry calls for a development which is properly regulated and monitored. This paper will seek to understand the constraints and challenges in the sustainable development of the accommodation sector in the local islands of the Maldives. Although the study is case specific (based on Kaafu Atoll), the result will contribute to the existing knowledge base on the importance of sustainable policies and practices as a part for maintaining a favorable destination growth and for overall value generation among the stakeholders. Moreover, this study will provide the industry players with comprehensive information on best sustainable practices which would assist them in formulating sustainable business development and policy creation which will deliver maximum host community benefits.

Methodology

The study intends to carry out an exploratory

multi-method approach to gain an in-depth understanding on stakeholder's perception on the development of accommodation sector in the local islands of the Maldives. Semi-structured focus group discussions will be conducted with council members to obtain data on the existing rules, regulations, and policies to promote sustainable growth; and with local community to assess the level of involvement and decision-making power in the development of the accommodation sector in the island. Individual semi-structured interviews will be conducted with accommodation owners/ service providers explore their understanding on sustainable growth of accommodation sector on a socio-economic dimension.

Project Title: *Exploring the sustainability of the accommodation sector in the local islands of the Maldives: A case of Kaafu Atoll*

Grant Amount: MVR 82100

Principle Applicant: Sadha Ahmed

Entitled Isolation and Characterization of Pathogenic Microorganisms from Public Recreational Maldivian Ocean Waters in Artificial Beaches, Swimming Tracts and Lagoons

In Maldives there are several diseases caused by pathogenic microbes have been reported. They are responsible for significant morbidity and mortality among the population of Maldives. In the hospitals of Maldives many cases of respiratory tract infections have been observed. These hospitals also reported several diarrheal cases. In addition to these, many reports of urinary tract infections. Many children and elderly people in Maldives were also diagnosed with meningitis. It is to be noted that significant cases of skin infections were also frequently reported in the community. The pathogens causing these infections are usually transmitted through water. This water may contain pathogens like E coli, Salmonella, Shigella, Staphylococcus, Vibrio, parasites and viruses. These microorganisms present in Maldivian public recreational ocean waters can be the source of these infections.

Ocean is an ideal environment for survival and growth of microorganisms. Ocean water contains organic nutrients, salts, suitable pH, temperature and sunlight to support the colonization of microbes. Ocean contains both pathogenic and non-pathogenic microorganisms. Pathogens may be introduced into ocean through human activities, fecal contamination, sewage contamination or through polluted water. Addition of human or animal excreta or sewage pollution into the sea plays a crucial role in the introduction of pathogenic microorganisms. In many instances, even treated sewage contained surviving bacteria, viruses, parasitic ova and

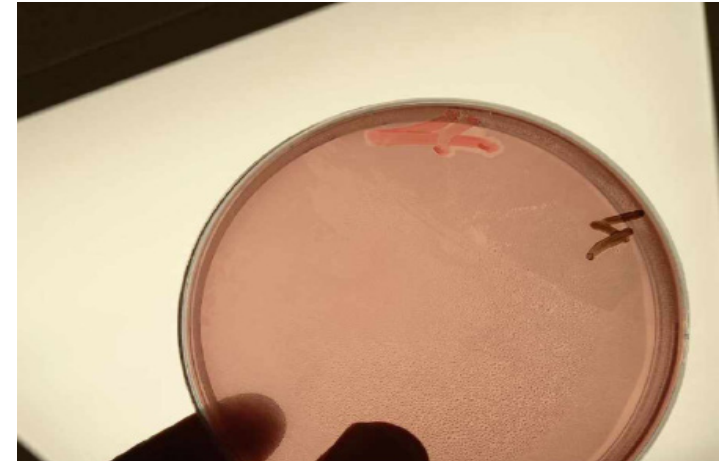
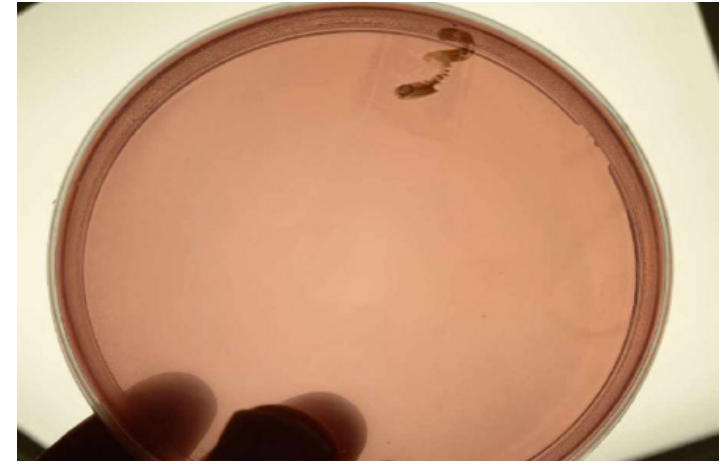
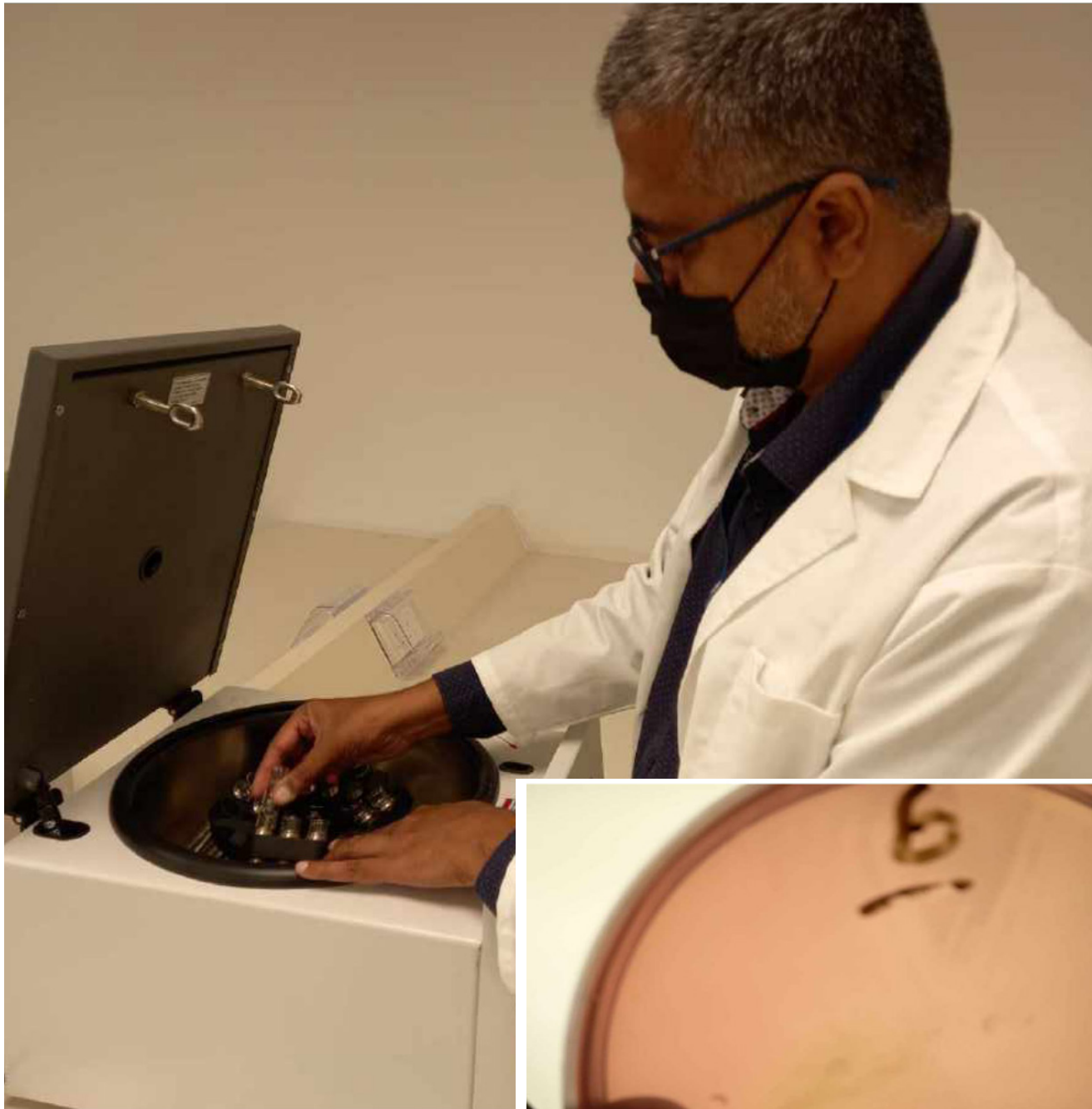
cysts. Since the organic content is high in sewage or in feces, pathogenic microorganisms can even survive chlorination, the method most commonly used to treat water. Bacteria like Salmonella, Shigella, E coli, Vibrio, Pseudomonas, Aeromonas, Legionella, Leptospira can be present in marine environment and cause human infection. Parasites like Toxoplasma, Entamoeba, Giardia, Cryptosporidium, Isospora and infectious helminths can be acquired through ocean waters. In this study, we investigated the presence of pathogenic bacteria, parasitic ova cysts, and fungi. Water samples from various sites like artificial beaches, swimming tracks and lagoons were cultured for microbial isolation and identification. Examination of specific pathogenic bacteria in these waters were performed by enrichment culture followed by biochemical identification. Identification of parasitic ova / cysts were carried out by sedimentation or floatation techniques. Culture on Sabouraud's dextrose agar (SDA) was used to isolate pathogenic fungi present in water samples. In our study we observed that, Rasfannu, Male artificial beach revealed the presence of heavy load of bacteria. Artificial beach Male' also showed high bacterial population. High coliforms count in these places may be due to high human activity. High bacterial count may be due to fecal pollution. Increased bacteria may be due to, excreta from sea animals. Algal bloom in some areas may favor bacterial population. Artificial beaches in Male are relatively static when compared to other sites like swimming g tracks /

public beaches. In our study we found that other pathogens investigated were negative. Pathogens like Salmonella, Shigella, Vibrio cholerae, Vibrio parahaemolyticus and Proteus were observed to be negative. Parasites like Entamoeba histolytica, Giardia lamblia and helminths O & P were absent. In addition to that tests for dermatophytes and dandruff causing fungi were also showed negative. The reason may be these pathogens released from the source is usually very few in numbers. The artificial beach Rasfannu and other places contains algal bloom. We recommend that the algal bloom should be cleaned in these artificial beaches. There is a toilet located at the Rasfannu, that should be shifted. If sewage is released near the Ocean, that should be treated well before the release. Investigations at least once in six months should be conducted. Artificial beaches are heavily loaded with microorganisms Male' Rasfannu is highly contaminated. As per regulations the load of the microorganisms was more. We noticed that in addition to the coliforms, E coli and Pseudomonas are high in numbers.

Project Title: *Entitled Isolation and characterization of pathogenic microorganisms from public recreational Maldivian ocean waters in artificial beaches, swimming tracts and lagoons*

Grant Amount: *MVR 95000*

Principle Applicant: *Kannan Subbaram & Aminath Huda*



Classification of Maldivian Atoll Islands Based on the Adaptation Potentials and Preparation of an Adaptation Plan

Demonstration of the classification of Maldivian islands based on adaptation for four island types in the Maldives, along with the preparation of state-of-the-art hazard maps based on historical flood events and shoreline changes. This also includes suggestions for alternative adaptation measures, incorporating nature-based solutions for the islands.

Project Title: *Classification of Maldivian Atoll Islands Based on the adaptation potentials and preparation of an adaptation plan*

Grant Amount: MVR 868000

Principle Applicant: Professor Gerd Masselink

Nursing and Midwifery Competency Exam for MNMC

Newly graduated nurses and midwives as well as expatriates are mandated by the Nursing and Midwifery Council (MNMC) to pass Nursing and midwifery competency exam for registration and practicing licence.

Project Title: *Nursing and midwifery competency exam for MNMC*
Grant Amount: *MVR 90000*
Principle Applicant: *Sizna Mohamed, Aminath Shiuna*

Nurse Educators Self-Reported Competency using SEARO Regional Competency Tool

This is a WHO funded Country Assessment for Nursing Educators self-reported competency using SEARO Regional Competency Assessment Tool. The results of this project will help identify areas to improve in relation to nursing educators.

Project Title: *Nurse Educators Self-Reported Competency using SEARO Regional Competency Tool*
Grant Amount: *MVR 150000*
Principle Applicant: *Aminath Shafia, Fathimath Haleem, Zeena A. Qayyoom*

Team-Based Learning - Student Assessment Instrument (TBL-SAI) for measuring the effectiveness of TBL in Biochemistry Modules for the students of School of Medicine in Maldives

Team-Based Learning - Student Assessment Instrument (TBL-SAI) for measuring the effectiveness of TBL in Biochemistry Modules for the students of School of Medicine in Maldives.

Introduction: Team-Based Learning (TBL), emphasizing pre-class preparation and in-class knowledge application, is a widely recognized pedagogical approach. This research investigates the efficacy of TBL in Biochemistry modules at the Maldives National University's School of Medicine, employing the Team-Based Learning-Student Assessment Instrument (TBL-SAI).

Objectives: The study aims to assess TBL-SAI's psychometric properties and analyze mean scores across different academic batches. Subscales include Accountability, TBL Preference, Preference for Lecture or TBL, and Satisfaction.

Literature Review: Past research, including studies in Saudi Medical School, Tehran University of Medical Science, and the University of Florida, supports TBL's effectiveness in medical education. The emphasis on accountability, satisfaction, and preference for TBL emerges as consistent themes in these studies, aligning with the current research focus.

Methodology: Conducted as a cross-sectional study at the Maldives National University, 60 participants attending TBL in Biochemistry modules from 2020

to 2022 were included. The TBL-SAI, measuring Accountability, TBL Preference, Preference for Lecture or TBL, and Satisfaction, was utilized. Open-ended questions were analyzed thematically, providing additional qualitative insights. Statistical analyses, including Cronbach's alpha, factor analysis, Pearson's correlation coefficients, and survey responses, were employed.

Results: The TBL-SAI demonstrated high reliability and validity, with a total Cronbach's alpha of 0.842. Subscale scores for TBL Preference (0.845), TBL Satisfaction (0.944), Preference for Lecture (0.874), and Accountability to Team (0.658) showcased the instrument's effectiveness. Factor analysis indicated data appropriateness, and significant correlations between subscales affirmed convergent validity.

Discussion: The findings suggest that TBL effectively enhances Biochemistry learning in the School of Medicine. The positive student perceptions, reflected in TBL-SAI scores, highlight the method's impact on engagement and satisfaction. The study contributes crucial insights for shaping future medical school teaching strategies in the Maldives and similar educational contexts.

Conclusion: In conclusion, this research establishes the positive impact of TBL on Biochemistry education at the Maldives National University's School of Medicine. The TBL-SAI emerges as a reliable and valid instrument for assessing student perceptions,

providing valuable data for informed decision-making in medical education planning and design. The study's implications extend beyond the Maldives, offering a model for enhancing Biochemistry education in diverse medical education settings.

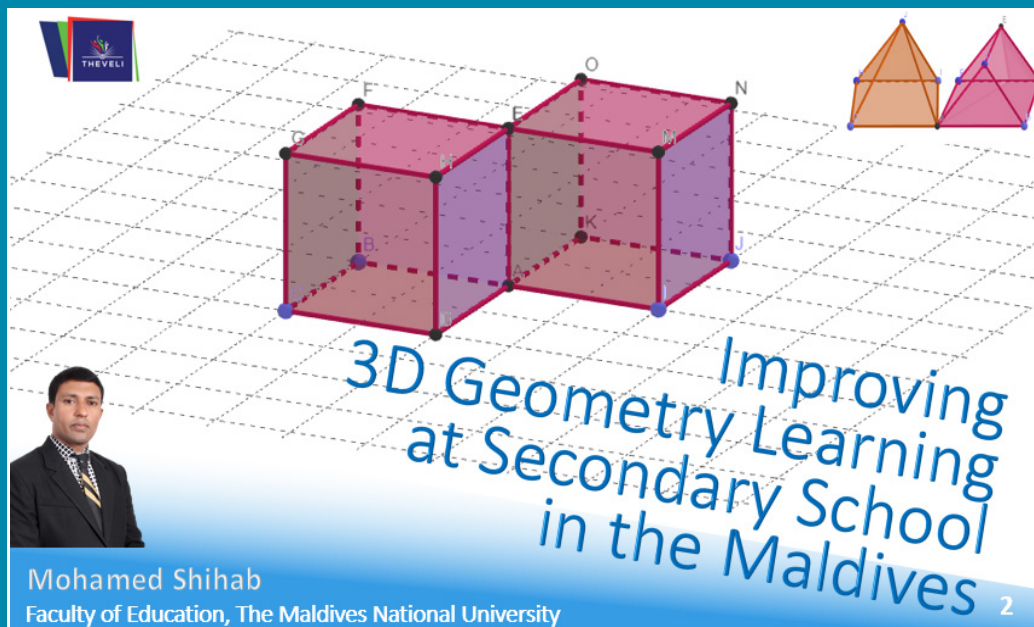
Project Title: *Team-Based Learning - Student Assessment Instrument (TBL-SAI) for measuring the effectiveness of TBL in Biochemistry Modules for the students of School of Medicine in Maldives*
Principle Applicant: Zeba Un Naher, Aminath Shafia Adam, Razana Faiz, Tawsif Mahdeen Ali Lasker, Mohamed Naaif, & Fathimath Farahath





Improving 3D Geometry Learning at Secondary Schools in Maldives

This is a self-initiative research project initiated in 2023, and this research was presented at Theveli Conference 2023. This research aimed to improve 3D geometry learning in Maldivian secondary schools. It is a mixed-method research involving surveying secondary school students' responses to 3D geometry tasks, interviews, and student-completed task analysis as a means for data. The research will be completed by this year (2024), developing a research paper and submitting it for journal publication.



Mohamed Shihab
Faculty of Education, The Maldives National University

Project Title: *Improving 3D Geometry Learning at Secondary Schools in Maldives*
Principle Applicant: Mohamed Shihab

Results

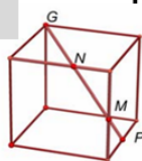
Q1



How many cubes are in this sack?

Question	N	10	6	Other	No Answer
Q1	58	90	12	6	15
%		36.5	23.1	11.5	28.8

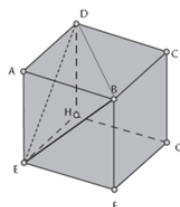
Q2



Are the points GNMP colinear? How?
Can it be none colinear? Why?...

Are the points GNMP colinear?	NO	YES	No Answer
Total 52	11	36	5
%	21.2	69.2	9.62

Q3



What specific shape is form, with BDE inside the cube?
What is the size of angle DEB?

N = 52	90°	60°	45°	22.5°	No Response
Frequency	9	7	14	2	20
%	17.3	13.5	26.9	3.85	38.5

Predictors of Geriatric Sociability, Loneliness and Depression in the Maldives

Approximately 15% of the elderly population is estimated to suffer from a mental disorder that can be addressed through early diagnosis and interventions. This paper aimed to assess the predictors of loneliness, depression and social isolation using data from 312 older adults in Maldives. Three distinct multiple linear regression models were fitted to each mental health indicator. A statistically significant association was observed among loneliness, depression and sociability. The majority of the Maldivian elderly were social, suffered mild levels of depression and low levels of loneliness. The Maldivian concept of free-living older citizens with close proximity to their families as opposed to the concept of elderly in nursing homes apart from families may have contributed to this ideal depiction. Due to the observed multicollinearity, the design of geriatric health policies, care strategies and response interventions for the elderly need to target all three mental health indicators together.

Project Title: : *Predictors of geriatric sociability, loneliness and depression in the Maldives*
Principle Applicant: Zahudha A Azeez, Mariyam Suzana

Particle Verbs Versus Simplex Verbs in Maldivian English

This research project is aimed at finding the different usages of English language by Maldivians, specifically particle verb usage in the Maldivian variety of English. The research studies the contrast between simplex verbs and their innovative particle-verb alternatives in a short-term diachronic database of Maldivian newspaper texts and with the help of acceptability ratings of the forms concerned collected through an online survey.

Project Title: : *Particle verbs versus simplex verbs in Maldivian English*
Principle Applicant: Dr. Tobias Bernaisch, Aishath Suad & Aminath Saeed

Temporal Patterns of Cancer Burden in Asia, 1990–2019: a Systematic Examination for the Global Burden of Disease 2019 study

This study analyzes the trends in cancer incidence, mortality, disability, and associated risk factors across 29 cancers in Asia over the past three decades. Utilizing data from the Global Burden of Disease study (1990–2019), the research examines age, sex, and year-wise estimates of cancer burden, including incidence, mortality, and disability-adjusted life years (DALYs). The findings indicate a significant burden of cancer in Asia, with millions of lives lost and millions more affected by DALYs in 2019. The study highlights considerable variations in cancer rates across Asian countries, with certain cancers showing significant increases in incidence and mortality over time. Notably, smoking, alcohol use, ambient particulate matter pollution, and unsafe sex are identified as dominant risk factors contributing to cancer burden, with notable increases in cancer DALYs attributed to ambient PM pollution, high body mass index, and fasting plasma glucose between 1990 and 2019.

Project Title: *Temporal patterns of cancer burden in Asia, 1990–2019: a systematic examination for the Global Burden of Disease 2019 study*
Principle Applicant: Please refer to: [https://www.thelancet.com/journals/lansea/article/PIIS2772-3682\(23\)00193-2/fulltext#appsec1](https://www.thelancet.com/journals/lansea/article/PIIS2772-3682(23)00193-2/fulltext#appsec1)

Workforce Localisation in the Resort Sector of the Maldives

The resort sector of the Maldives has played a vital role in the development of the Maldives, influencing the economy, culture, environment, society, and governance. The resort sector is predominantly staffed by expatriates, with many workers employed. Therefore, achieving the proper equilibrium between local and expatriate forces with a priority on developing local employment opportunities is vital. Creating relevant and proactive policies and action plans to build human capital is essential. This study aims to evaluate the current challenges concerned with workforce localisation in the resort sector of the Maldives. This research adopts an exploratory case study approach with the target population being the managers and human resource managers of resorts in the Maldives. The sample population was selected using non-probability purposive sampling. Data was collected using semi-structured, open-ended interviews with twelve participants. The interviews were transcribed and coded, and themes were generated using content analysis. The overarching themes indicate the need for national-level strategies and collective effort from the industry, the regulatory authorities, and educational institutions. The key findings suggest conflicting opinions on striking a balance between expatriate and local workers. The challenge lies in attracting the required workforce from the local population, leading to a reliance on expatriates. The lack of local skills, experience and qualifications adds to the burden of local recruitment. However,

findings indicate that areas and roles in the resort sector can be easily localised, thus benefiting the local population. Currently, the government and the resort sector facilitate local development by aiming to close the linguistic proficiency gap, internships, and graduate management programs. The research findings highlight the importance of creating job value, combatting misconceptions and stereotyping, cultivating a work-oriented mindset, and having an inclusive policy paving part-time employment for students. Furthermore, career counselling, real-world learning experiences and training facilities are integral to the success of workforce localisation in the Maldives.

Project Title: : *Workforce localisation in the resort sector of the Maldives*
Grant Amount: *MVR 50925*
Principle Applicant: *Zahudha A Azeez, Mariyam Suzana*

Student-Led Research at MNU

Effect of Obesity on Developing Surgical Site Infections: A Study Among Post Operative Patients in Indira Gandhi Memorial Hospital

Obesity, a global health challenge, is linked to higher SSI rates due to alterations in immune function, impaired wound healing, and comorbidities like diabetes mellitus. The increased operative time, wound tension, and difficulty in maintaining sterility during surgery contribute to the elevated SSI risk in obese individuals. Preventive measures include preoperative optimization, weight management, glycemic control, and judicious use of antimicrobial prophylaxis. By understanding this association and implementing tailored interventions, healthcare providers can improve outcomes for obese surgical patients. Further research is needed to develop more effective preventive strategies for reducing SSIs in this vulnerable population group.



Project Title: *Effect of obesity on developing surgical site infections: A study among post operative patients in Indira Gandhi Memorial Hospital*
Principle Applicant: Aminath Thoifa Abdul Qafoor , Maryam Reeath Hameed , Mohamed Anoof Shaheem & Maumoon Asim

Significance of CRP in Complicated and Uncomplicated Appendicitis

This retrospective study conducted at Indira Gandhi Memorial Hospital in the Maldives aimed to assess serum C-reactive protein (CRP) levels in acute appendicitis patients. Of the 167 patients studied, 82.6% exhibited elevated CRP levels. Notably, complicated cases showed significantly higher mean CRP levels compared to uncomplicated cases ($p < 0.001$). CRP demonstrated superior diagnostic performance over traditional markers like WBC and the Alvarado score. A cutoff CRP value of 5.94 mg/dL was determined for diagnosing complicated appendicitis, with 81.1% sensitivity and 76.9% specificity. CRP outperformed the Alvarado score in distinguishing between complicated and uncomplicated cases. However, further studies are warranted to confirm these findings and refine diagnostic approaches for acute appendicitis

Importance: Appendicitis is one of the most common digestive diseases in the Maldives. The lack of studies in this area prompts the need for further research. This study represents a pioneering advancement in its category.

Objectives: This study aimed to determine whether there is an increase in serum C-reactive protein (CRP) levels in acute appendicitis patients and if the raise of CRP level is significant in complicated appendicitis.

Design, Setting, and Participants: This retrospective, cross sectional observational study included clinically diagnosed acute appendicitis patients, aged between 6-59 years who underwent emergency appendectomy from January 2021 to December 2022 at the Indira Gandhi Memorial Hospital (IGMH). Of these patients, who had Rheumatoid arthritis, Systemic Lupus Erythematosus, Inflammatory Bowel Disease, Pericarditis or Cancer were excluded from the study.



Project Title: *Significance of CRP in Complicated and Uncomplicated Appendicitis*

Principle Applicant: Hammaad Adam, Aishath Unadha, Aminath Waafira, Fathmath Noora, Mariyam Ihusana, & Nalira Yaugoob

Knowledge, Attitude and Practices of Doctors Towards Postoperative Pain Management in the Greater Male'

Migrant workers comprise the majority of the construction workforce in the Maldives. Despite the industry being one of the most dangerous fields worldwide, there is not adequate information regarding occupational injuries among migrant construction workers within Maldives. Additionally, A occupational safety and health (OSH) standards among migrant construction workers remain overlooked. Hence, in this cross-sectional study, an association between exposure to common construction-related hazards and occupational injuries among migrant construction workers in the Greater Male' area was studied using logistic regression. Similarly, an association between knowledge of OSH standards and occupational injuries was also explored. A questionnaire was developed to collect the data at common recreational areas frequented by migrant workers in the Greater Male' area and at health camps for migrant workers. The analysis was done using Statistical Package for Social Sciences and Microsoft Excel Software. This study found that the likelihood of sustaining an occupational injury as a migrant construction worker in the Greater Male' area increases with the amount of exposure to the hazards. On the other hand, it was revealed that there is no association between knowledge regarding OSH with the likelihood of sustaining an occupational injury. Additional factors associated with occupational injuries among migrant construction workers in the Greater Male' area were studied using Chi-square tests of independence, analysis of variance, and linear regression. The findings of this study were consistent with previous research done in this field. This preliminary study on the workplace safety practices, knowledge and occupational injuries among migrant construction workers in the Greater Male' area suggests adopting a proactive approach through provision of appropriate personal protective equipment, vigilant monitoring and inspection of construction sites, and maintaining injury surveillance, in order to keep migrant workers safe on the construction sites in the Maldives.



Project Title: *Significance of CRP in Complicated and Un-complicated Appendicitis*
Principle Applicant: Ma'ani Fathulla Ismail, Aishath Afshath, Aminath Aleefa Abdul Gani, Aminath Saahath, & Mariyam Ifaaf Abdul Azeez

Common Gram Positive and Gram-Negative Bacteria Isolated from Intensive Care Unit of Indira Gandhi Memorial Hospital, Male', Maldives

This is a study conducted at Indira Gandhi Memorial Hospital (IGMH) aimed to assess contamination in the intensive care unit (ICU) by identifying common Gram-positive and Gram-negative bacteria on high-touch surfaces. Over 50 days, 45 samples were collected from the nursing station, patient bed, and patient surroundings using sterile swabs. The samples were cultured and analyzed for bacterial growth and type using colony morphology, Gram staining, and biochemical tests. Results showed that 75.6% of samples exhibited bacterial growth, with 37 bacterial isolates identified, consisting of 81.1% Gram-positive and 18.9% Gram-negative bacteria. The most frequently isolated bacteria were coagulase-negative Staphylococci (51.4%) and Staphylococcus aureus (29.7%), with lactose fermenting enterobacteriaceae (10.8%) being the most common Gram-negative species. The nursing station was identified as the most contaminated surface, with a 100% positivity rate. This study highlights the presence of potentially pathogenic bacteria on high-touch surfaces in the ICU and provides valuable insights for further research in this area, marking the first study of its kind in the Maldives.

Background: Nosocomial infections occurring in hospitals are one of the major challenges in healthcare, the intensive care unit (ICU) being one of the leading reservoirs of nosocomial bacteria.

Background: Nosocomial infections occurring in hospitals are one of the major challenges in healthcare, the intensive care unit (ICU) being one of the leading reservoirs of nosocomial bacteria.

Objectives: The aim is to assess significant contamination in the ICU by identifying common Gram positive and Gram-negative bacteria on high touch surfaces at Indira Gandhi Memorial Hospital (IGMH). Additionally, the study aims to determine the most contaminated high-touch surfaces and analyze differences in bacterial types across different locations.

Methods: A total of 45 samples were collected over a 50 days period from the

nursing station, patient bed, and patient surrounding. Moist sterile swabs were used to collect samples and these were inoculated into sterile nutrient broth tubes and incubated, followed by inoculation onto three different solid culture media. Bacterial colonies were identified based on colony morphology, Gram staining and biochemical tests. Data was analysed using Microsoft Excel and SPSS (Statistical Package for the Social Sciences) and stored securely.

Results: Among the 45 samples, 75.6% of them exhibited growth and 37 bacterial isolates were identified, out of which 81.1% and 18.9% were Gram positive and Gram negative respectively. The most frequently isolated bacteria were coagulase-negative Staphylococci (CoNS) 51.4% followed by Staphylococcus aureus (S.aureus) 29.7%. The most common Gram negative bacterial species were lactose fermenting (LF) enterobacteriaceae 10.8%. Nursing station was the most contaminated surface which has a 100% positivity rate.

Conclusion: High-touch surfaces in ICU were contaminated with potentially pathogenic bacteria. This research marks the first study in the Maldives to identify common Gram-positive and Gram-negative bacteria on high-touch surfaces within the ICU of IGMH, providing valuable insights for further studies in this area.



Project Title: Common Gram Positive and Gram-Negative Bacteria Isolated from Intensive Care Unit of Indira Gandhi Memorial Hospital, Male', Maldives

Principle Applicant: Aishath Zeena Abdul Jaleel, Aminath Shafeenaz Moosa, Saifulla Muslim, & Shifa Ishaq

A Snapshot of Postoperative Pain Management in the Greater Male', Maldives: A KAP Study Among Doctors in Perioperative Care

Background: There is limited information regarding the knowledge, attitudes, and practices of doctors towards postoperative pain management in the Maldives. Our study is the first of its kind in the Maldives. The primary objective of this study is to investigate the knowledge, attitudes, and practices of doctors in perioperative care towards postoperative pain management in the Greater Male' area. It also set out to determine any associations between the aforementioned variables and other variables: age, sex, experience in years, department of their employment, and training on postoperative pain assessment and management.

Methods and Findings: A cross-sectional study was conducted between May and July 2023 in three tertiary hospitals of Greater Male', Maldives. Our population was doctors who perform surgeries or manage postoperative pain. Stratified random sampling was used to select 134 participants from the three hospitals, and data was collected through a self-administered questionnaire. Descriptive statistics, linear regression analysis, independent samples t-tests and Analysis of Variance were carried out. Incorrect responses to specific questions. According to the research findings, the respondents attained a mean score of 15.28 ± 2.48 SD (out of 22), 7.92 ± 1.94 SD (out of 12) and 6.38 ± 1.80 SD (out of 9) for knowledge, attitudes, and practices respectively. Some questions on pain assessment and pharmacological related questions were also explored, where there was a low frequency of correct responses. The lowest scored question for knowledge was regarding the use of opioids during the pain evaluation period when the source of pain is unknown. There were only 28.6% (32) correct responses for the question. The lowest scored question for attitudes was question regarding pain assessment, where only 23.9% (32) gave the correct answer. A significant negative relationship was found between doctors' years of experience and knowledge ($B = -0.07$, 95% CI (-0.13, -0.01), $p = .023$). The difference in mean scores of knowledge between the departments was significant ($F = 3.31$, $df = 113$, $p = .013$), with the anesthesiology department having scored

the highest. The findings further revealed a significant difference in mean practice score between those who received training on postoperative pain management and those who did not ($t(132) = 3.02$, $p = .002$). Inability to generalize the study to the whole population of the Maldives and responder bias were the key limitations of this study.

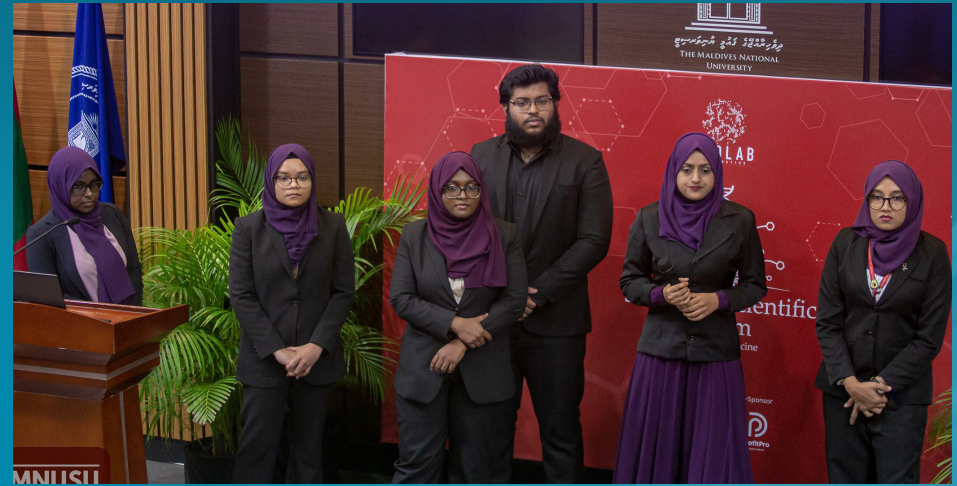
Conclusions: The scores for knowledge, attitudes and practices were generally good. The increase in age and the years of experience yielded lower knowledge scores. The level of practice was comparatively better among participants who received training than otherwise. Thus, we recommend frequent education and training on postoperative pain management, and establishment of acute pain services in the Maldives. A country wide research with objective assessment of practices is also recommended



Project Title: *A snapshot of postoperative pain management in the Greater Male', Maldives: A KAP study among doctors in perioperative care*
Principle Applicant: Ziuna Zubair, Asra Ismail, Maryam Niusha Naseer, Suha Ibrahim, Yasra Ismail, & Abdulla Ubaid

Severity of COVID-19 among the Pediatric Patients in Indira Gandhi Memorial Hospital

The novel coronavirus disease 2019 (COVID-19) emerged in Maldives in March 2020, initially believed to affect adults more severely than children, who were observed to have milder symptoms. However, severe complications including pneumonia, ARDS, and MIS-C have been identified in pediatric cases globally. A retrospective cross-sectional study conducted at IGMH Pediatrics Department from March 2020 to May 2023 analyzed data from 158 COVID-19 patients, excluding asymptomatic cases, utilizing various statistical tests to assess illness severity based on demographics, symptoms, complications, and laboratory findings. The study revealed that the majority of children (88%) had mild illness, with a small percentage experiencing moderate, severe, or critical illness. While most patients recovered fully, a few were referred abroad or succumbed to complications. Symptoms such as rash, nausea/vomiting, lethargy, and seizures were more common in non-mild cases, along with elevated levels of certain laboratory markers, indicating distinct patterns in disease severity.



Project Title: *Severity of COVID-19 among the Pediatric Patients in Indira Gandhi Memorial Hospital*

Principle Applicant: Fathimath Suman, Aishath Imthisal Ismail, Fathmath Hamna Mohamed, Fathimath Mohamed Saeed, Hafsa Hafsiyya Hussain, Muneeb Ismail Mohamed, Dr. Fatema Al Zahra, & Hawwa Ashfah

Association between Physical Activity, BMI, Stress and Blood Pressure Among Students of Maldives National University

This study addresses the health determinants among Maldivian college students, focusing on the associations between Body Mass Index (BMI), stress, physical activity, and blood pressure. With a lack of research on this demographic, the study aims to understand these associations and their collective impact on health. Utilizing a cross-sectional design, data was collected from 348 Maldives National University students aged 18-45 through health screening events. The results reveal concerning levels of high blood pressure, obesity, physical inactivity, and stress among participants. The study emphasizes the need for proactive health measures and early intervention to mitigate long-term health risks in the Maldivian population. It aims to inform targeted interventions and public health initiatives to address these health challenges effectively.



Project Title: *Association between Physical Activity, BMI, Stress and Blood Pressure among students of Maldives National University*
Principle Applicant: Aishath Zaara, Fathimath Maaha Adhil, Latheefa Hussain, Mohamed Naaif, Zooshan Thaufeeq, & Punya Laxmi Manandhar.

Evaluation of In-Hospital Mortality in Indira Gandhi Memorial Hospital

This study investigates in-hospital mortality at Indira Gandhi Memorial Hospital (IGMH) in Maldives, aiming to understand the causes of death and associated factors influencing mortality rates. Using secondary data from HINA, collected from January 1st to December 31st, 2022, the study analyzes 407 patients, predominantly Maldivian with a balanced gender distribution. The research reveals that Diseases and Disorders of the Respiratory System are the primary cause of death, contradicting previous national and WHO statistics which emphasize cardiovascular diseases. Sepsis with multiple organ dysfunction syndrome (MODS) is identified as the main immediate cause, often secondary to respiratory infection. Furthermore, a significant correlation between length of hospital stay and cause of death is observed, particularly among patients with respiratory diseases, highlighting the importance of improving respiratory health care efforts. This study underscores the need for further research into factors affecting in-hospital mortality and suggests potential areas for healthcare interventions.



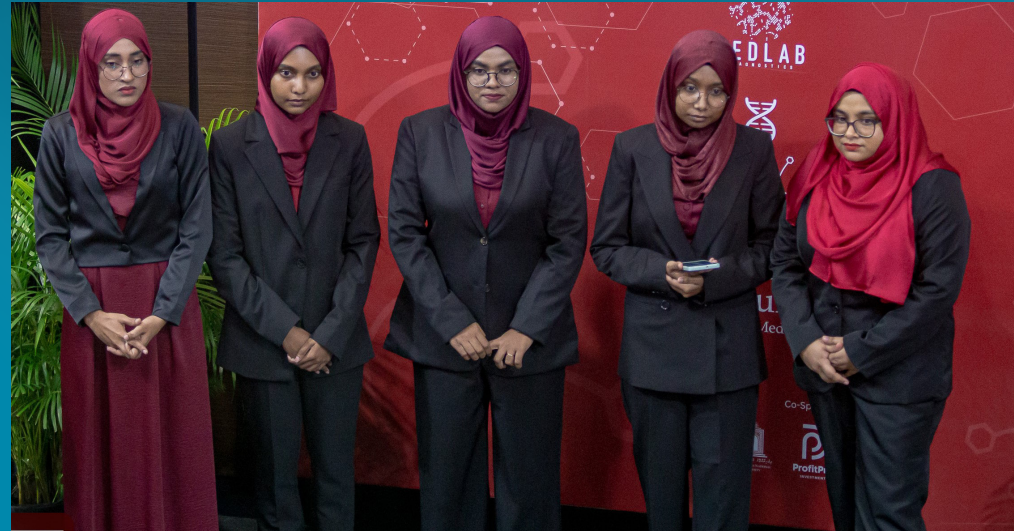
Project Title: *Evaluation of In-Hospital Mortality in Indira Gandhi Memorial Hospital*

Principle Applicant:

Zahuva Abdulla, Rifdha Ibrahim, Nadha Hussain, Haris Ibrahim, Salva Ahmed, Rijen Shrestha, & Zeyba Ahmed

Chemotherapy-induced Opportunistic infection among cancer patients treated in the Oncology unit of the main tertiary hospital in Maldives

This study addresses the risk of opportunistic infections among cancer patients undergoing chemotherapy at Indira Gandhi Memorial Hospital (IGMH) in the Maldives. Analyzing data from 101 chemotherapy-receiving cancer patients, the study found a significant association between neutropenia, advanced-stage cancer, combined chemotherapy, and the use of invasive devices with opportunistic infections. Neutropenia was present in 42.57% of patients, with 15.84% experiencing opportunistic infections. Genitourinary and respiratory systems were most affected, primarily by bacterial infections. Notably, granulocyte-colony stimulating factor (G-CSF) was associated with neutropenia. The study suggests the need for further research into the effects of antibiotics and radiotherapy on neutropenia and opportunistic infections to inform improved diagnostics and interventions.



Project Title: *Chemotherapy-induced Opportunistic infection among cancer patients treated in the Oncology unit of the main tertiary hospital in Maldives*

Principle Applicant: Aminath Mirusa, Aminath Ramiya Mohamed, Aminath Samha, Ashfa Ismail, & Mariyam Nasma Ibrahim

Socioeconomic Factors Affecting Health Seeking Behaviors of Bangladeshi Migrant Workers Living in Male', Maldives

This study examines the relationship between socioeconomic factors and health-seeking behaviors among Bangladeshi migrant workers in Malé, the capital of Maldives. Conducted through quantitative cross-sectional methods with 400 participants via convenience sampling, the research assesses various factors influencing healthcare seeking behaviors. Results indicate that factors such as employment categories, education level, health insurance coverage, living conditions, legal status, working hours, and awareness of healthcare services significantly impact the health-seeking behaviors of Bangladeshi migrant workers. The study underscores the challenges faced by this population in accessing healthcare, particularly due to language and cultural barriers. It concludes by emphasizing the importance of recognizing and addressing socioeconomic determinants to improve healthcare access and overall well-being among Bangladeshi migrant workers in Malé



Project Title: *Socioeconomic Factors Affecting Health Seeking Behaviors of Bangladeshi Migrant Workers Living in Malale', Maldives*
Principle Applicant: Anooof Abdulla, Anaan Hassan, Mariyam Nahaa Nizam, Aminath Huda, & Minah Faiz Rashad.

Commentary - Zombie viruses: genomic properties, molecular morphology and its biothreat

The emergence of Paleolithic viruses due to climate change is acknowledged as a significant concern in the 21st century. These viruses, affecting eukaryotic organisms, potentially pose a threat to modern-day life. Understanding the host specificity of these “zombie viruses” is crucial, as they may have a wide range of hosts. However, scientific data on their pathogenicity and virulence are currently lacking. Given the ability of modern viruses to cause outbreaks and epidemics, it’s plausible that zombie viruses could follow similar epidemiological patterns. These viruses may have the potential to cause various infections, including fatal diseases, warranting further research and vigilance.

Project Title: *Commentary - Zombie viruses: genomic properties, molecular morphology and its biothreat*

Principle Applicant: Kannan, S., Zeba, U. N., Fatema, A. S. A., Razana, F., Huda, A., Punya, L. M., Eya, I. L., Shayan, M., Akhtar, M. S., Faiyazuddin, M., & Miranda, A. V.

Structural analysis and design of G+4 storied Apartment Building

This project deals with planning, analyzing and designing of an Apartment building. Apartment building is like a framed structure, it is a multi-storey structure with G+4 floors. Designing and detailing of this building are as per IS codes. The architectural and frame-in plan of the complex was obtained via Auto CADD. The dead and live loads of the building have been analyzed by using ETABS 2015 (Extended 3D analysis of building systems) software. For designing the framed structure, we have to follow the codes- IS 456-2000 and IS 875-1987(part-1 & part-2).

Project Title: *Structural analysis and design of G+4 storied Apartment Building*

Evaluating the impact of open green spaces on the thermal comfort of Male' city residents/ ICEST conference

Publication in International Journal/ This study investigates the effect of green spaces on the thermal comfort of different outdoor urban areas in Male', the capital city of the Maldives. The aim is to provide empirical evidence of the benefits of urban greenery for mitigating heat stress. Temperature and humidity were measured in both direct sun and shade in various locations with different levels of vegetation cover. The results show that areas with more greenery have significantly lower average temperatures than

areas with less vegetation. The study concludes that increasing urban greenery can enhance thermal comfort and reduce the urban heat island effect in tropical cities.

Project Title: *Evaluating the impact of open green spaces on the thermal comfort of Male' city residents/ ICEST conference*

Mechanical Properties of Fiber Reinforced Self Curing Concrete Incorporating Polyethylene Glycol-600

Self curing concrete relies on supplying water throughout a freshly placed cementitious mixture using reservoirs, that readily release water as needed for hydration or to replace moisture lost through evaporation or self- desiccation (American Concrete Institute 2010). Self curing concrete is known to be easily cracked under low level tensile stress, for its inherent weakness in resisting tensile forces. The use of fiber in a suitable combination potentially improves the overall mechanical performances of concrete and result in performance synergy. The geometrical size and modulus of fibers are the main factors influencing the mechanical performances of fiber reinforced concrete. The paper aims to study the properties of fiber reinforced self curing concrete obtained by the addition of self curing agent polyethylene glycol- 600(PEG-600). In this experimental investigation the strength characteristics of concrete, cast with the self-curing agent, reinforced with steel fiber has been studied and compared with the corresponding nominal mix. IS method of mix design was adopted. Properties of the concrete such as compressive strength, split tensile strength, flexural strength and modulus of elasticity were studied. From the results optimum percentage fiber addition was obtained.

Project Title: *Mechanical Properties of Fiber Reinforced Self Curing Concrete Incorporating Polyethylene Glycol-600*

Research Publication

Shiyama, A. Abdul Muhiamin, F. N. & Shafeeqa, F. (in publishing). Our World, Our Futures: Transforming education through environmental and sustainability education. The Maldives National Journal of Research, Volume 11 Special Issue (Theveli 2023)

UKFIET 12-14 September 2023 - Our World, Our Futures: Exploring transformative environmental and global citizenship education in Maldivian and English primary schools

Theveli 21-22 August 2023 - Our World Our Future

Blogpost - <https://www.ukfiet.org/2023/pedagogies-for-climate-justice-helping-young-people-be-hopeful-for-the-future/>

Project Online Gallery - <https://www.ourworldourfutures.org.uk/exploring-our-surroundings/>

Elgezary Sarah A. et al. 2023. The Role of Infrastructure in Shaping Urban Planning: Case Study on Greater Male™ Region. ICEST 2023

Elgezary Sarah A. et al. 2023. Creating Sustainable Communities: Integrating Greenspaces in Residential Buildings in Malé City. ICEST 2023

Elgezary Sarah A. et al. 2023. From Concrete Jungle to Pedestrian paradise: The Transformation of urban spaces in Male to walkable cities. ICEST 2023

Nadheem, I, 2023. Use of Urban Green Space and Wellbeing of Individuals in Male™ City, In Maldives, International Conference on Innovations in Engineering, Science and Technology for Sustainable Development 2023. AIP Conference Proceedings.

Abdulla Aneel @ETAL, 2023, Evaluating the impact of open green spaces on the thermal comfort of Male' city residents, International Conference on Inno-

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Kannan, S., Zeba, U. N., Fatema, A. S. A., Razana, F., Huda, A., Punya, L. M., Eya, I. L., Shayan, M., Akhtar, M. S., Faiyazuddin, M., & Miranda, A. V. (2023). Commentary - Zombie viruses: genomic properties, molecular morphology and its biothreat. PubMed, 27(13), 5948-5950. https://doi.org/10.26355/eu-rrv_202307_32946

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MNU PROJECTS

1. Housing Market Survey (HDC) (2017). (Raheema Abdul Raheem, Fazeela Waheed, Aishath Ali, Shahbeena Ahmed)
2. Maldives Police Services, Perception Survey (2017-2018). (Raheema Abdul Raheem, Fazeela Waheed, Aishath Ali, Shahbeena Ahmed)
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4. STEPS survey (2019). (Raheema Abdul Raheem, Sheena Moosa, Aishath Naila- HPA, WHO)
5. ransfat Survey(2019-2020) (Aishath Naila, Raheema Abdul Raheem- HPA, WHO)
6. Rapid Assessment of the Prevalence and Character of Civil Society Organizations from Selected Regions in the Maldives (2020). (Aishath Shehenaz Adam, Ashia Leela Ahmed, Ahlam Niyaz, Nash'aa Ahmed Naseem, Aishath Naila, Raheema Abdul Raheem- Asia Foundation)
7. Documentation on COVID-19 Effective Response and Promoting Equity at Sub-National Level in selected countries (2020) (Fazeela Waheed, Raheema Abdul Raheem- WHO)
8. Seroepidemiological Survey to determine prevalence past exposure to COVID-19 (2020). (Raheema Abdul Raheem, Sheena Moosa, Fazeela Waheed- HPA)
9. The Impact of COVID-19 on the Tourism Sector(2020).
10. The Impact of COVID-19 on Higher Education(2020).
11. The Impact of COVID-19 on the Construction Sector(2020).
12. Housing Market Study(2020). (Fazeel Najeeb, Raheema Abdul Raheem, Aishath Shehenaz Adam, Athif Shakoor- HDC)
13. International Strategic Support for Accreditation of Programs and Internationalization at South Asian Higher Education Institutes (HEIs) (Raheema Abdul Raheem, Aishath Shehenaz Adam, Mariyam Shahuneeza Naseer, Ashia Leela Ahmed, Aminath Shiyama, Hawwa Shiuna Musthafa, Nash'aa Ahmed Naseem, Abdulla Nazeer)
14. A rapid assessment of the impact of COVID-19 on children
15. Leprosy Perception Survey (Sheena Moosa, Raheema Abdul Raheem, Sheeza Ali, Sana Saleem, Ryan Shah Rasheed,)
16. Perception regarding single use plastic (Aishath Naila, Abdulla Nazeer, Rifaath Hassan, Raheema Abdul Raheem- Env Min)
17. Youth study (Aishath Shehenaz Adam, Raheema Abdul Raheem, Aishath Naila, Hawwa Shiuna Musthafa, Nash'aa Ahmed Naseem, Aishath Shanoorra, Batool Zahoor Qazi, Zeenath Shakir, Nimal Mohamed- Youth ministry)
18. Fertility Project (2023).
19. MALDIVIAN CHILDREN'S HOLISTIC WELL-BEING: AN EXPLORATORY STUDY

Research & Enterprise



The Centre was established in 2013 as the Postgraduate Research Centre with the primary aim of promoting and supporting research within the University. In 2014, the University Council began granting research funds on submission of proposals. The funds were allocated from the revenue generated by MNU. This booklet summarizes the progress of some projects completed or underway. In addition, the booklet includes a project completed with the help of an external grant. For more information on the activities of the Research Centre, please call: 3345420.